

SEMs) from about 0.17 inch to about 1.128 inch; the base diameters of these cones varied from about 0.17 inch to about 1.128 inch. Converting these numbers to metric units on the above-mentioned scale (1 micron=0.564 inch) yields:

cone height range (approx.)=0.30 to 2.0 microns

cone base diameter range (approx.)=0.30 to 2.0 microns.

The same degree of uniformity was found in all the samples, and from sample to sample, at magnifications of 2,000 and 20,000, as compared with similar samples subjected to bulk etching without prior removal of the native oxide, as described in EXAMPLE NO. 2 above.

#### **IN THE FIGURES:**

Please add FIGS. 3A, 3B, 4A, 4B, 5, 6A, 6B, 7A, and 7B.

#### **IN THE CLAIMS:**

Please cancel claim 1.

Please add new claims 11-50 as follows:

11. (New) An implant to be surgically implanted in living bone, comprising:  
a threaded portion for engaging bone; and  
a uniformly metal an acid etched surface substantially lacking a native oxide layer and including a substantially uniform array of irregularities having peak-to-valley heights not greater than about 10 microns, said acid etched surface being located on at least a part of said threaded portion.
12. (New) An implant of claim 11, wherein substantial numbers of said irregularities are substantially cone-shaped elements.
13. (New) An implant of claim 11, wherein said native oxide is removed by a first acid solution after which the resulting surface is etched with a second acid solution.

14. (New) An implant of claim 13, said first acid solution is aqueous hydrofluoric acid.

15. (New) An implant of claim 13, wherein said second acid solution is a mixture of sulfuric and hydrochloric acids.

16. (New) An implant of claim 11, said acid etched surface being located on said threaded portion beyond the three uppermost turns of said threaded portion.

17. (New) A dental implant having a head portion, a neck portion, and a threaded portion for contact with bone wherein said head and neck portions are provided with a smooth surface for contact with overlying gingival tissue for blocking infection, and said threaded portion has a roughened region to promote osseointegration with bone while leaving at least one thread turn adjacent said neck portion smooth and unroughened, wherein said implant is titanium or a titanium alloy and said roughened region is created by a two-step process in which the native oxide is removed by contact with a first acid solution and followed by etching of the resulting surface with a second acid solution to produce a roughened surface consisting of a substantially uniform array of irregularities.

18. (New) A dental implant of claim 17, wherein said first acid solution is aqueous hydrofluoric acid.

19. (New) A dental implant of claim 18, wherein said second acid solution is a mixture of sulfuric and hydrochloric acids.

20. (New) A dental implant of claim 17, wherein substantial numbers of said irregularities are substantially cone-shaped elements.

21. (New) A dental implant of claim 17, wherein up to three turns adjacent to said neck portion are left smooth and unroughened.

22. (New) <sup>metal</sup> A dental implant, comprising:  
a head portion for receiving a dental restoration component;  
a threaded portion for engaging bone; and  
a roughened region for facilitating osseointegration with said bone and being located  
on a part of said threaded portion, said roughened region substantially lacking a native oxide  
layer and being <sup>uniformly</sup> etched with an acid solution to produce a substantially uniform array of  
irregularities having peak-to-valley heights not greater than about 10 microns.

23. (New) A dental implant of claim 22, wherein said roughened region is located  
in said threaded portion outside of the three thread turns nearest to said head portion.

24. (New) A dental implant of claim 22, wherein said acid solution is a mixture of  
sulfuric and hydrochloric acids.

25. (New) A dental implant of claim 22, wherein substantial numbers of said  
irregularities are substantially cone-shaped elements.

26. (New) A dental implant of claim 22, wherein said head portion includes a top  
surface, said roughened region beginning at a point about 3 mm below said top surface.

27. (New) A titanium implant to be surgically implanted in living bone,  
comprising:  
a head portion having a non-round fitting; and  
a threaded portion including a <sup>uniformly titanium metal</sup> roughened surface with a substantially uniform  
array of irregularities having a peak-to-valley heights ranging from about 0.3 micron to about  
10 microns.

28. (New) An implant of claim 27, wherein said irregularities include substantial  
numbers of substantially cone-shaped elements.

29. (New) An implant of claim 28, wherein said roughened surface is an acid etched surface produced by a mixture of sulfuric and hydrochloric acids.

30. (New) An implant of claim 27, wherein said irregularities have relatively uniform dimensions.

31. (New) An implant of claim 27, wherein said head portion is smooth and a part of said threaded portion is smooth.

32. (New) An implant of claim 31, wherein said roughened surface is an acid etched surface.

33. (New) An implant of claim 32, wherein said roughened surface substantially lacks a native oxide layer.

34. (New) An implant of claim 27, wherein said head portion includes an upper flat surface, a portion of said implant between said upper flat surface and a point about 3 mm below said upper flat surface being smooth.

35. (New) An implant of claim 27, wherein said head portion includes an upper flat surface, a portion of said implant between said upper flat surface and a third uppermost thread turn on said threaded portion being smooth.

36. (New) An implant of claim 27, wherein said roughened surface has been subjected to grit blasting.

37. (New) A titanium device to be surgically implanted in living bone, comprising:  
a uniformly titanium metal  
an acid-etched exterior surface being substantially free of a native oxide layer and including a substantially uniform array of irregularities having base-to-peak heights of less than about 10 microns.

38. (New) A titanium device of claim 37, wherein said irregularities include substantial numbers of substantially cone-shaped elements.

39. (New) A titanium device of claim 37, wherein said exterior surface is generally cylindrical.

40. (New) A titanium device of claim 39, wherein said exterior surface is threaded.

41. (New) A titanium device of claim 40, wherein said device has upper and lower portions, said lower portion including said acid etched exterior surface, said upper portion being smooth.

42. (New) A titanium device of claim 37, wherein said native oxide layer is removed through etching with a first acid solution.

43. (New) A titanium device of claim 42, wherein said first acid solution is a HF solution.

44. (New) A titanium device of claim 37, wherein said acid etched surface is produced by a mixture of sulfuric and hydrochloric acids.

45. (New) A titanium device of claim 37, wherein said irregularities have relatively uniform dimensions.

46. (New) A titanium device of claim 45, wherein said irregularities are cone-like structures.

47. (New) A titanium device to be surgically implanted in living bone and including a uniform exterior surface being substantially free of a native oxide layer and roughened to titanium metal

produce a substantially uniform array of irregularities having relatively uniform dimensions and peak-to-valley heights of less than about 10 microns, substantial numbers of said irregularities being substantially cone-shaped elements.

48. (New) A titanium device of claim 47, wherein said roughened exterior surface is an acid etched surface.

49. (New) A titanium device of claim 48, wherein said acid etched exterior surface is produced by a mixture of sulfuric and hydrochloric acids.

50. (New) A titanium device of claim 47, further including a head portion with an upper flat surface, said roughened exterior surface beginning about 3 mm below said upper flat surface.